

Patient Safety

Team Training (Crew Resource Management)



System Failures & Human Factors

- Excessive number of handoffs
- Long work hours
- Excessive workload
- Variable information availability
- Conflict resolution policy
- No mutual support

Disclosure

I work with Harvard's Risk Management Foundation to provide QA & team training educational programs



Dr Lucian Leape



Tenerife - March 27, 1977

The largest aircraft accident in history - 2
Boeing 747s collided **582 Deaths**

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The U.S.S. Vincennes

Navy Missile Downes Iranian Jetliner

Monday, July 4, 1988

A U.S. warship in the Persian Gulf mistook an Iranian civilian jetliner for an attacking Iranian F14 fighter plane and blew it out of the hazy sky 290 persons were aboard.



Crew Resource Management ERROR AVOIDANCE STRATEGY

“...error management capability to detect, avoid, trap, or mitigate the effects of human error and therefore prevent fatal accidents”.

1989 Army, Navy Air Force
1997 commercial airlines



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Crew Resource Management

- Concepts
 - ◆ Asking for relevant information
 - ◆ Offering relevant information
 - ◆ Communicating proposed actions
 - ◆ Advocacy
 - ◆ Conflict resolution

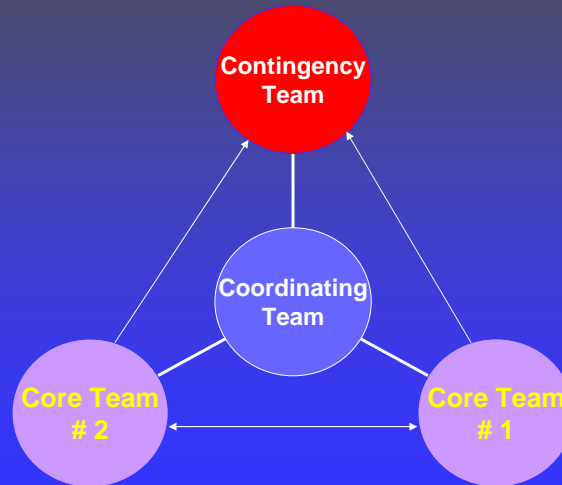
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Team Meetings



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Team Structure and Relationships



Team Training

- Leadership
 - ◆ Resource management
 - ◆ Facilitate the other teamwork skills
 - ◆ Conflict Resolution
 - ◆ Ensure structure, Briefings and Debriefings
- Situation monitoring
- Mutual support
- Communication
- Implementation

Situation Monitoring

The continuous process of actively scanning and assessing one's surroundings to gain or maintain an accurate awareness of the situation in which the team is functioning

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Can CRM Work in Medicine?

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RMF STUDY'S MOST FREQUENT TEAMWORK FAILURES

10 years of closed OB claims – structured review

| | |
|---|------------|
| Cross-monitor action of team members | 76% |
| Communicate essential team information | 67% |

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How to Change Culture

Professional Pride
Sentinel Events
Financial Incentive
Outcomes Data
BURNING PLATFORM

Suzanne Powers

Baby Luke DOB Thanksgiving 2000

- G1P0
- Ruptured uterus – hysterectomy
- Stillbirth
- 18 days ICU, 3 weeks in hospital
- Settlement with family April 2001
- Annual Luke Powers memorial lectureship

Changes

- Redesigned QA & QI programs
- Team training (2002)
 - ◆ Funded by: Department of Defense & Harvard's Risk Management Foundation

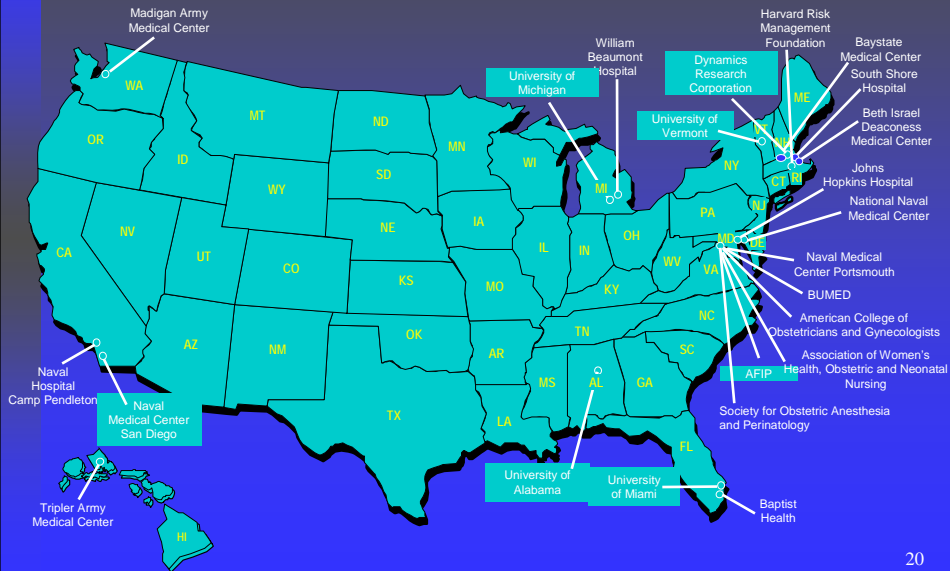
Crew Resource Management

Medical Errors Reduction Research



Funding:
US Department of Defense
Risk Management Foundation of the Harvard Medical
Institutions

Hospitals & Professional Organizations



Objectives

Evaluate the effect of team training system on:

- Maternal and neonatal outcomes
 - Process measures – proxy for efficiency of care
 - Staff and patient satisfaction
- 1307 personnel trained and 28,536 deliveries
- Analysis: Cluster-based RCT

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Interim Results

Cluster - level analysis of covariance

- AOI: No significant difference
- Time to perform emergency Cesarean delivery: significant difference
- Wide range in clinical outcomes by hospitals
 - ◆ AOI: Average = 9.2 Range = 5.9 – 16.6

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Possible Explanations No Difference in AOI

- Power: **Required N = 26 hospitals**
- Iraq war ~ 70% staff turnover military hospitals
- 120 days too short to achieve culture change

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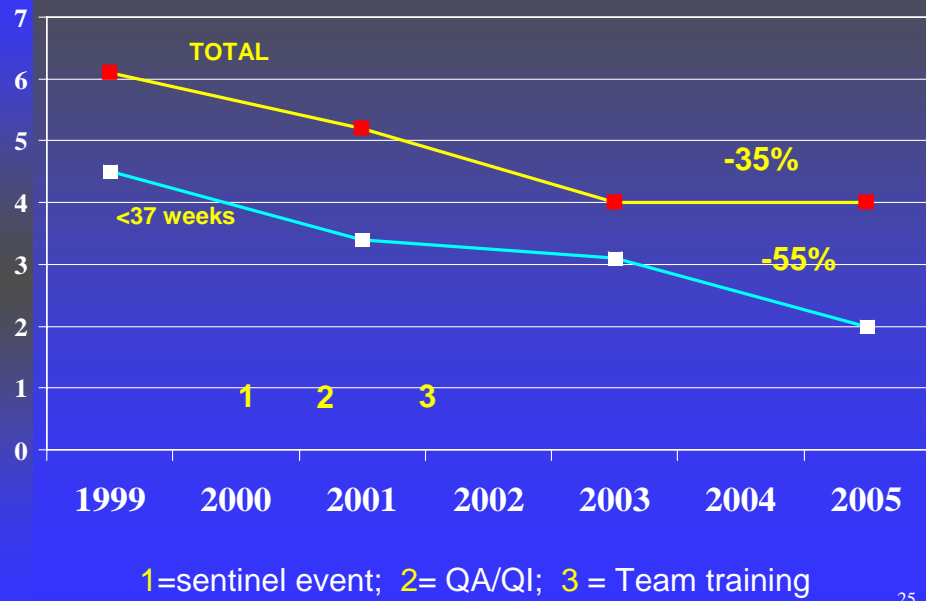
Beth Israel Deaconess
Medical Center

HARVARD
MEDICAL SCHOOL



- 
- **5,000 deliveries per year**
 - **Staff: full-time & private practice**
 - **~ 20% patients Medicaid insurance**
 - **NICU ADC 43 babies**
- 

Adverse Outcomes Index: BIDMC 1999-2005



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BIDMC: Indemnity Experience

| 36 months Pre- & Post-Team Training | Claims + suits + observations | No. High Severity (%) |
|--|-------------------------------|-----------------------|
| 8/1/1999 - 7/31/2002 ~15,000 deliveries | 20 | 11 (55%) |
| 8/1/2002 – 7/31/2005 ~15,000 deliveries | 11 | 5 (45%) |

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BIDMC: Indemnity Experience

| 36 months Pre- & Post-Team Training | Claims + suits | No. High Severity (%) |
|--|----------------|-----------------------|
| 8/1/1999 - 7/31/2002 ~15,000 deliveries | 7 | 5 |
| 8/1/2002 - 7/31/2005 ~15,000 deliveries | 2 | 1 |

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NATIONAL PERINATAL INFORMATION CENTER

*A non-profit organization
dedicated to serving the perinatal
community through information,
research and education.*

19 Hospitals

85,000 deliveries

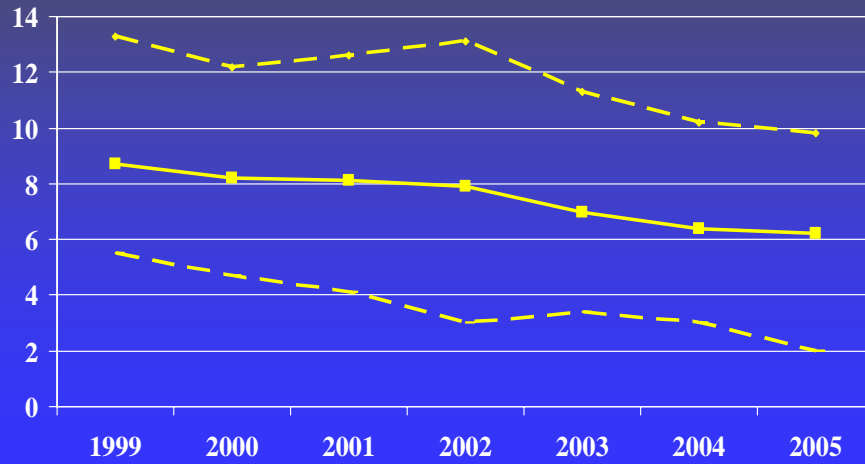
per Year

1999 - 2005



Birth-death linked data

Adverse Outcomes Index
National Perinatal Information center
19 Hospitals (85,000 deliveries/year): Average & Range



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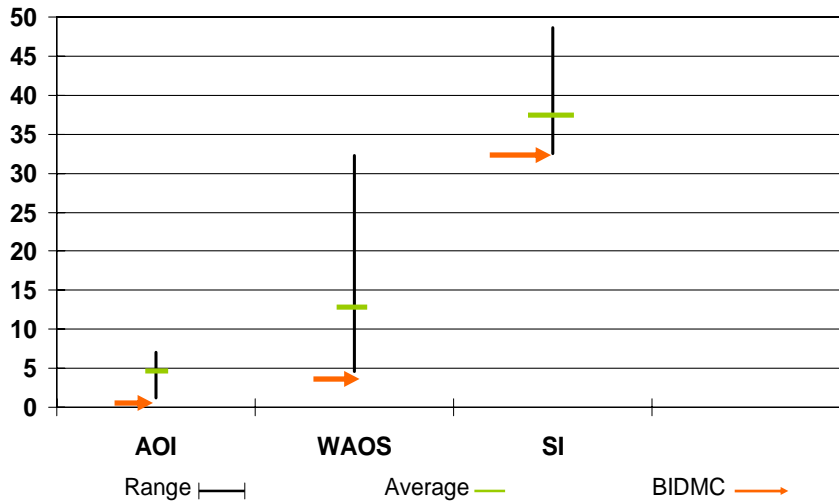
TREND DATA 1999 -2005

NPIC = 19 Hospital

| | 1999 | | 2005 | | % Change | |
|---------------------|-------|------|-------|------|--------------|---------------|
| | BIDMC | NPIC | BIDMC | NPIC | BIDMC | NPIC |
| AOI | 6.1 | 8.7 | 4 | 6.2 | 35% ↑ | 29% ↑ |
| <37 WEEKS | 4.5 | 2.9 | 2 | 3.1 | 55% ↑ | 7% ↓ |
| SI | 19 | 23.6 | 11.4 | 24.8 | 40% ↑ | 4.8% ↓ |
| WAOS | 1.15 | 2.03 | .45 | 1.59 | 61% ↑ | 22% ↑ |

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BIDMC vs Academic Hospitals 2005 (NPIC)



Patient Safety Programs

- Quality Assurance Committee
 - ◆ Real time data
- Quality Improvement Committee
- Clinical guidelines
- Team training

Team Training Possible Applications & Implications

- Obstetrics
- Operating rooms
- Emergency rooms
- Intensive care units
- Addition to medical/nursing school and residency curriculums

- Tort reform & reduction in liability insurance costs

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